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Assignable Area of College and University Buildings, by Facilities Category, Function, and Type of Institution, E. Eugene Higgins and M. Louise Stewart. April 1963, 6 p.

OE–51004–17
Ratio of Equipment Investment to Building Investment, E. Eugene Higgins and Linda L. Wright. June 1963, 6 p.

OE–51004–18
New Construction and Rehabilitation on College Campuses, 1961–62, W. Robert Bokelman and Leslie F. Robbins. November 1963, 9 p.

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Science Facilities Planning Aids, March 1964.

OE–51004–3A
Library Facilities Planning Aids, May 1964.

OE–51004–7A
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Division of Higher Education

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College and University Physical Facilities Series

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

Withdrawn

April 1963 OE-51004-16

ASSIGNABLE AREA OF COLLEGE AND UNIVERSITY BUILDINGS, BY FACILITIES CATEGORY, FUNCTION, AND TYPE OF INSTITUTION

by E. Eugene Higgins, Specialist for Physical Facilities
and
M. Louise Stewart, Statistical Assistant

Institutions in the aggregate United States participating in the "Inventory of College and University Physical Facilities, December 31, 1957," 1/ reported 441,816,700 square feet of assignable area in their buildings. Assignable area is the floor area of a room or space having a function as defined in this study. Institutions were requested to report assignable area in net square feet 2/ by each room's designated function. It should be noted that "function" as used here is not the same as "primary function" used in OE-51004-14. In the current study, assignable area is reported by room or space within a building according to its actual use (function), whereas in OE-51005-14 gross area by building was reported according to the building's primary function (the predominant function).

The assignable area reported for facilities such as laboratories, shops, gymnasiums, auditoriums, cafeterias, libraries, and infirmaries includes the area of all supporting spaces that are devoted exclusively to the activities of the function assignable to the room. The area reported for an individual room includes closets and other space devoted exclusively to the activities of the room; for a suite of rooms, all of the area devoted to the suite is included. Single family dwellings (faculty and staff houses, and presidents' houses) are reported in gross square feet, so that in this study their assignable area is the same as their gross area.

Tables 1 (public institutions) and 2 (private institutions) present assignable area by facilities category and function, as well as by type of institution. Using the fall 1957 enrollment, assignable areas per student have been computed. Comparison of these tables reveals that the assignable area per student for the combined facilities categories and for the combined types of institutions is higher for private institutions than for public, 162.0 against 142.9. By type of institution, however, the assignable area per student is higher for public than for private colleges at all types of institutions except liberal arts colleges and junior colleges. For the general or academic classroom function, the assignable area per student enrolled averages 14.1 square feet for the combined public higher education institutions, ranging from 23.5 at other independent professional schools to 9.9 at junior colleges. For private colleges, the corresponding average is 17.0 square feet, with a range from 30.0 at theological and religious schools to 11.4 at universities.

1/ Part 3 of a 5-part study, *College and University Facilities Survey*, now in process. The institutions queried included all those listed in the *Education Directory, 1957-58. Part 3, Higher Education* (branch institutions considered separate institutions when they reported separately), except for those for which the survey was not applicable. It should be noted that as of that date Alaska and Hawaii were considered outlying parts. Respondents represented 85.0 percent of these higher education institutions (public, 91.2; private, 81.6) and 95.7 percent of their fall 1957 enrollment (public, 97.8; private, 93.0).

2/ Net square feet is defined as the area of a room based upon measurements taken from inside walls at floor level. Where there are minor architectural projections (less than 12 inches), the distance between typical walls is used.

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Table 1.--Assignable area (in square feet) per student enrolled in fall 1957 1/ in buildings occupied by PUBLIC higher education institutions as of December 31, 1957, by type of institution, facilities category, and function: Aggregate United States

(L = less than 0.05 percent)

Facilities category and function	All types	University	Liberal arts college	Teachers college	Independent technological school	Other independent professional school	Junior college	Technical institute--engineering-related
1	2	3	4	5	6	7	8	9
ALL CATEGORIES	142.9	173.7	119.9	155.5	212.6	305.4	55.1	100.0
INSTRUCTIONAL FACILITIES	56.4	60.7	49.2	63.6	98.7	143.1	34.1	88.1
Educational laboratory schools	2.7	1.4	2.5	10.6	---	---	0.1	---
General or academic classrooms 2/	14.1	14.5	13.4	17.1	20.5	23.5	9.9	21.9
Home management laboratory houses	0.2	0.2	0.2	0.4	---	0.2	L	---
Instructional laboratories and shops 3/	17.8	20.1	15.5	13.5	37.1	42.0	14.1	63.2
Library 4/	7.7	9.9	6.9	7.5	8.1	12.9	2.7	2.9
Museum	0.5	0.8	0.2	0.4	1.3	0.2	L	---
Other instructional	0.8	1.0	1.4	0.5	1.0	1.1	0.2	---
Physical education 5/	10.2	10.2	8.4	13.7	30.7	2.4	7.1	---
Teaching hospital	2.1	2.5	0.8	---	---	60.7	---	---
RESEARCH FACILITIES 6/	7.2	13.8	1.4	0.6	4.1	25.3	0.2	---
Agriculture	2.4	4.8	0.2	0.1	---	6.4	0.1	---
Astronomy	L	L	0.1	---	---	---	---	---
Biology	0.5	1.0	L	L	---	---	L	---
Chemistry	0.5	1.0	L	---	0.1	---	---	---
Dentistry	L	L	---	---	---	0.8	---	---
Engineering	0.8	1.6	L	0.2	2.8	---	---	---
Mathematics and statistics	L	L	---	---	0.1	---	---	---
Medicine	0.7	1.1	0.5	---	---	10.8	---	---
Not identified	1.7	3.2	0.4	0.2	1.1	6.4	L	---
Other physical sciences	0.1	0.2	0.2	L	L	0.9	---	---
Physics	0.3	0.6	L	---	0.1	---	---	---
Social sciences	0.1	0.2	---	0.1	---	---	---	---
RESIDENTIAL FACILITIES	39.9	48.6	37.2	54.9	56.9	25.0	7.4	---
Faculty and staff apartments	1.7	1.9	1.9	1.6	7.2	2.4	0.5	---
Faculty and staff houses	1.8	1.8	2.0	2.3	6.8	---	0.5	---
Fraternity and sorority houses	0.3	0.4	0.2	0.3	---	---	L	---
Hotel-type accommodations	0.6	1.2	0.2	0.2	0.2	1.6	L	---
Married-student apartments	7.3	11.8	3.2	5.8	11.7	1.6	0.8	---
President's houses	0.5	0.4	0.6	1.1	1.5	---	0.2	---
Residence halls for single men 7/	13.8	17.5	11.6	15.9	28.7	5.5	3.5	---
Residence halls for single women 7/	13.9	13.5	17.5	27.7	0.9	14.0	1.9	---
GENERAL FACILITIES	31.2	41.2	23.5	27.3	42.2	96.6	9.9	4.2
Armories	0.4	0.7	0.2	0.1	0.1	3.4	0.1	---
Auditoriums	2.5	2.0	3.0	4.5	1.9	2.8	2.0	---
Chapels	0.1	0.1	0.1	0.1	0.3	---	L	---
Extension service and experiment stations	0.3	0.6	L	L	---	---	L	---
Faculty clubs and facilities	0.1	0.2	L	0.1	0.3	L	0.1	---
Faculty offices 8/	7.6	10.3	5.9	6.0	9.8	19.5	2.3	3.1
Garages	0.8	1.3	0.6	0.4	0.8	0.5	0.2	---
General storage	2.3	3.4	1.1	1.4	6.8	1.7	0.8	---
Maintenance shops, stores, and services	3.4	3.9	3.1	3.4	6.5	21.7	0.9	---
Multi-purpose	2.5	3.5	1.8	2.8	0.9	5.0	0.5	---
Nonteaching hospital	0.2	0.5	L	---	L	0.2	---	---
Other general	3.5	4.6	2.3	2.1	4.7	23.3	0.6	---
Power and heating plant	1.4	1.6	1.2	2.0	2.2	2.9	0.6	---
Staff offices 9/	5.7	8.3	3.7	3.4	7.8	15.4	1.6	1.2
Theaters	0.3	0.4	0.4	0.3	---	---	0.2	---
AUXILIARY FACILITIES	8.3	9.5	8.5	9.1	10.6	15.4	3.5	7.7
Auxiliary enterprise	1.2	1.7	1.0	1.0	2.5	0.4	0.5	2.8
College unions	2.3	3.2	1.5	2.5	1.9	2.1	0.9	---
Food service (nonresidential) 10/	4.0	3.7	5.3	4.9	5.3	12.8	2.0	4.9
Student infirmaries	0.7	0.9	0.8	0.7	0.9	0.1	0.1	---

1/ Total degree-credit enrollments as reported in Opening Enrollment in Higher Educational Institutions, Fall 1957 (Circular No. 518). U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1958. 48 p. Enrollments not available from this source obtained directly from the institutions or from fall 1957 enrollments reported in Education Directory, 1958-1959, Part 3, Higher Education. U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1959. 194 p.

2/ Includes seminar and lecture rooms; must have student stations.

3/ Includes music practice rooms, band rooms, home economics laboratories, art studios, and machine rooms (rooms having calculators, adding machines, and duplicating and transcribing machines used primarily for instruction).

4/ Includes reading rooms, workrooms, stacks, offices, storage, and accessory areas.

5/ Includes fieldhouses, swimming pools, gymnasiums, and other areas available for use of the physical education and athletics programs.

6/ Includes research laboratories provided for faculty and graduate students, including such related service facilities as sterilizer rooms, darkrooms, animal quarters, controlled environment storage rooms, and greenhouses provided in regular academic buildings.

7/ Includes floor area occupied by built-in equipment, such as closets, desks, and beds; includes lounges used both by the general public and restricted to use by occupants; includes areas used for games and recreation; includes offices, mailroom, switchboard room, trunk storage, laundry and ironing rooms, and enclosed delivery areas; includes rooms assigned to persons who direct and counsel with the residents, such as house mothers, directors, and counselors; includes food service for residence hall occupants.

8/ Includes faculty members and their staff employees.

9/ Includes administrative and staff employees (exclusive of faculty staff personnel).

10/ Includes food storage, preparation, serving, dining, dishwashing, and other related areas of restaurants, cafeterias, dining rooms, snack bars, and grills.

Table 2.--Assignable area (in square feet) per student enrolled in fall 1957 1/ in buildings occupied by PRIVATE higher education institutions as of December 31, 1957, by type of institution, facilities category, and function: Aggregate United States

(L = less than 0.05 percent)

Facilities category and function	All types	University	Liberal arts college	Teachers college	Independent technological school	Theological and religious school	Other independent professional school	Junior college	Technical institute--engineering-related
1	2	3	4	5	6	7	8	9	10
ALL CATEGORIES	162.0	117.3	197.5	129.6	131.4	371.5	139.5	237.5	62.7
INSTRUCTIONAL FACILITIES	56.7	43.1	66.7	47.1	52.1	75.3	73.2	75.0	43.2
Educational laboratory schools	0.6	0.6	0.6	4.2	---	0.2	0.1	0.1	---
General or academic classrooms 2/	17.0	11.4	21.2	15.3	13.4	30.0	17.4	29.7	15.8
Home management laboratory houses	0.1	L	0.3	---	L	---	---	0.1	---
Instructional laboratories and shops 3/	13.9	11.4	14.9	11.7	24.5	5.1	18.8	15.7	25.1
Library 4/	10.1	8.2	12.2	8.2	4.9	28.5	6.7	10.1	1.5
Museum	0.6	0.5	0.6	0.7	0.1	0.3	1.6	0.1	---
Other instructional	0.6	0.3	0.7	0.3	0.3	1.3	2.3	0.9	---
Physical education 5/	11.5	7.5	16.2	6.8	8.8	10.0	2.0	18.4	0.8
Teaching hospital	2.3	3.1	---	---	---	---	24.3	---	---
RESEARCH FACILITIES 6/	5.2	9.1	1.2	1.2	7.2	1.8	12.9	0.4	0.7
Agriculture	0.1	0.1	L	---	---	---	---	---	---
Astronomy	L	L	L	---	L	---	---	---	---
Biology	0.3	0.6	0.1	---	---	---	0.3	0.1	---
Chemistry	0.3	0.4	0.2	---	0.6	---	0.7	---	---
Dentistry	L	0.1	L	---	---	---	---	0.1	---
Engineering	0.5	0.8	L	---	2.5	---	---	0.1	---
Mathematics and statistics	0.1	0.1	L	---	0.3	---	---	---	---
Medicine	1.9	3.7	0.1	---	---	---	8.7	---	---
Not identified	1.3	1.9	0.7	1.2	3.2	1.8	2.2	0.1	0.7
Other physical sciences	0.2	0.5	L	---	0.1	---	1.0	---	---
Physics	0.4	0.8	0.1	---	0.4	---	---	---	---
Social sciences	0.1	0.2	L	---	0.2	---	0.2	---	---
RESIDENTIAL FACILITIES	59.3	31.2	83.0	52.4	42.0	206.7	17.7	107.4	2.1
Faculty and staff apartments	4.4	2.6	5.8	2.3	6.0	17.3	1.4	5.5	---
Faculty and staff houses	4.7	1.3	7.3	3.3	2.7	24.7	1.0	9.2	---
Fraternity and sorority houses	0.7	0.5	0.9	---	1.6	---	0.2	0.1	---
Hotel-type accommodations	0.4	0.4	0.4	---	0.1	1.3	0.2	0.3	---
Married-student apartments	4.5	3.7	3.8	15.6	3.8	47.7	1.9	3.1	---
President's houses	0.8	0.2	1.4	0.6	0.2	2.7	0.3	2.6	---
Residence halls for single men 7/	20.7	14.1	26.1	8.3	17.2	87.0	5.7	27.4	2.1
Residence halls for single women 7/	23.2	8.5	37.2	22.3	10.5	26.0	7.0	59.2	---
GENERAL FACILITIES	32.0	28.2	35.2	22.7	25.0	65.8	30.5	38.4	14.7
Armories	0.1	0.1	0.2	---	0.2	---	---	L	---
Auditoriums	3.1	1.3	4.5	2.1	1.1	4.6	2.7	7.7	4.8
Chapels	2.5	1.0	3.7	2.1	0.1	15.4	0.1	4.0	---
Extension service and experiment stations	L	L	---	---	---	---	---	---	---
Faculty clubs and facilities	0.2	0.2	0.2	0.1	0.3	0.5	0.2	0.1	---
Faculty offices 8/	6.4	6.4	6.6	6.4	7.4	9.3	5.1	5.6	1.6
Garages	0.4	0.3	0.6	0.2	0.2	1.0	0.3	0.6	---
General storage	1.4	1.3	1.5	0.3	1.9	2.5	1.5	1.4	---
Maintenance shops, stores, and services	3.0	2.7	3.3	1.5	2.3	5.7	3.5	2.4	1.4
Multi-purpose	2.8	3.0	2.4	1.9	1.1	6.2	3.0	4.2	2.7
Non-teaching hospital	0.5	0.8	0.1	---	---	---	2.9	---	---
Other general	3.1	2.7	3.3	1.5	4.4	6.8	3.0	4.0	0.1
Power and heating plant	1.6	1.1	1.9	1.8	1.4	3.3	1.3	2.0	0.1
Staff offices 9/	6.0	6.0	5.9	4.9	4.3	10.4	6.9	6.1	4.0
Theaters	1.1	1.3	1.2	---	0.4	---	---	0.3	---
AUXILIARY FACILITIES	8.8	5.7	11.4	6.2	5.0	21.9	5.2	16.4	2.0
Auxiliary enterprise	1.2	1.0	1.4	0.3	0.9	3.0	0.5	1.8	0.6
College unions	1.8	1.5	2.2	0.7	1.0	3.1	0.7	2.8	---
Food service (nonresidential) 10/	5.0	3.0	6.5	4.4	2.8	14.6	3.9	10.4	1.4
Student infirmaries	0.8	0.3	1.2	0.9	0.3	1.2	0.1	1.4	---

1/ Total degree-credit enrollments as reported in Opening Enrollment in Higher Educational Institutions, Fall 1957 (Circular No. 518). U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1958. 48 p. Enrollments not available from this source obtained directly from the institutions or from fall 1957 enrollments reported in Education Directory, 1958-1959, Part 3, Higher Education. U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1959. 194 p.

2/ Includes seminar and lecture rooms; must have student stations.

3/ Includes music practice rooms, band rooms, home economics laboratories, art studios, and machine rooms (rooms having calculators, adding machines, and duplicating and transcribing machines used primarily for instruction).

4/ Includes reading rooms, workrooms, stacks, offices, storage, and accessory areas.

5/ Includes fieldhouses, swimming pools, gymnasiums, and other areas available for use of the physical education and athletics programs.

6/ Includes research laboratories provided for faculty and graduate students, including such related service facilities as sterilizer rooms, darkrooms, animal quarters, controlled environment storage rooms, and greenhouses provided in regular academic buildings.

7/ Includes floor area occupied by built-in equipment, such as closets, desks, and beds; includes lounges used both by the general public and restricted to use by occupants; includes areas used for games and recreation; includes offices, mailroom, switchboard room, trunk storage, laundry and ironing rooms, and enclosed delivery areas; includes rooms assigned to persons who direct and counsel with the residents, such as house mothers, directors, and counselors; includes food service for residence hall occupants.

8/ Includes faculty members and their staff employees.

9/ Includes administrative and staff employees (exclusive of faculty staff personnel).

10/ Includes food storage, preparation, serving, dining, dishwashing, and other related areas of restaurants, cafeterias, dining rooms, snack bars, and grills.

In order that comparisons by facilities category and type of institution may be easily made, condensed versions of tables 1 and 2 have been prepared as tables 3 and 4. For the combined types of public institutions, the greatest amount of assignable area per student enrolled is 56.4 square feet for instructional facilities, followed in descending order by residential (39.9), general (31.2), auxiliary (8.3), and research (7.2). Corresponding areas per student are given for each type of institution, with an overall high of 305.4 square feet for other independent professional schools and an overall low of 55.1 square feet for junior colleges.

Table 3.--Assignable area (in square feet) per student enrolled in fall 1957 in buildings occupied by PUBLIC higher education institutions as of December 31, 1957, by type of institution and facilities category: Aggregate United States

Type of institution	Facilities category					
	All categories	Instructional	Research	Residential	General	Auxiliary
ALL TYPES	142.9	56.4	7.2	39.9	31.2	8.3
University	173.7	60.7	13.8	48.6	41.2	9.5
Liberal arts college	119.9	49.2	1.4	37.2	23.5	8.5
Teachers college	155.5	63.6	0.6	54.9	27.3	9.1
Independent technological school	212.6	98.7	4.1	56.9	42.2	10.6
Other independent professional school	305.4	143.1	25.3	25.0	96.6	15.4
Junior college	55.1	34.1	0.2	7.4	9.9	3.5
Technical institute--engineering-related	100.0	88.1	---	---	4.2	7.7

For the combined types of private colleges, the largest amount of assignable area per student is 59.3 square feet for residential facilities, followed in diminishing sequence by instructional (56.7), general (32.0), auxiliary (8.8), and research (5.2). Corresponding areas per student are shown for each institutional type, with an overall high of 371.5 square feet for theological and religious schools and an overall low of 62.7 square feet for engineering-related technical institutes.

Table 4.--Assignable area (in square feet) per student enrolled in fall 1957 in buildings occupied by PRIVATE higher education institutions as of December 31, 1957, by type of institution and facilities category: Aggregate United States

Type of institution	Facilities category					
	All categories	Instructional	Research	Residential	General	Auxiliary
ALL TYPES	162.0	56.7	5.2	59.3	32.0	8.8
University	117.3	43.1	9.1	31.2	28.2	5.7
Liberal arts college	197.5	66.7	1.2	83.0	35.2	11.4
Teachers college	129.6	47.1	1.2	52.4	22.7	6.2
Independent technological school	131.4	52.1	7.2	42.0	25.0	5.0
Theological and religious school	371.5	75.3	1.8	206.7	65.8	21.9
Other independent professional school	139.5	73.2	12.9	17.7	30.5	5.2
Junior college	237.5	75.0	0.4	107.4	38.4	16.4
Technical institute--engineering-related	62.7	43.2	0.7	2.1	14.7	2.0

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College and University Physical Facilities Series

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

June 1963 OE-51004-17

RATIO OF EQUIPMENT INVESTMENT TO BUILDING INVESTMENT

by E. Eugene Higgins, Specialist for Physical Facilities
and
Linda L. Wright, Research Aide

From data reported for the "Inventory of College and University Physical Facilities, December 31, 1957," 1/ it has been possible to compare capital expenditures for higher education equipment with expenditures for the buildings in which the equipment is located. Comparisons have been made in terms of the ratio of the plant fund investment for equipment to the plant fund investment for buildings. This ratio is herein termed a percent, to conform to common practice in making rough estimates of equipment costs.

It should be noted that amounts reported in the tables and figures that follow do not include every building for which data were received. They report matched figures only; that is, an investment figure for equipment was used only when the capital expenditure for its building was also reported by the respondent, and vice versa. Furthermore, data for only three recent time intervals have been considered (the 1930-39 and 1940-49 decades and the 1950-57 period), since this is an adequate period to show the effects of equipment replacements as well as additions of equipment, some of which may have been nonexistent in earlier years. Also, while labor costs are involved in both buildings and equipment, the effects of increases in such costs may have a lesser influence upon equipment costs, because of the counteracting factors of mass production and factory assembly line methods. Undoubtedly, there are additional factors which have relevance here. It seems reasonable, therefore, that the most recent percentages are the most significant ones, especially for consideration in preparing rough budget estimates for current use.

Figure 1 shows graphically the percentage that equipment investment is of building capital outlay at institutions under public control, for certain types of institutions and by period of initial occupancy. A definite downward trend in the ratio of equipment cost to building cost is readily observed. In addition, there is a diminishing range between high and low percentages, producing the effect of convergence in the most recent period of the curves representing institutional types.

Table 1 presents data for public higher education institutions for the 1950-57 period only. In the United States, for the combined types of institutions, it is seen that equipment

1/ Part 3 of a 5-part study, *College and University Facilities Survey*, now in process. The institutions queried included all those listed in the *Education Directory, 1957-58, Part 3, Higher Education* (branch institutions considered separate institutions when they reported separately), except for those for which the survey was not applicable. It should be noted that as of that date Alaska and Hawaii were considered outlying parts. Respondents represented 85.0 percent of these higher education institutions (public, 91.2; private, 81.6) and 95.7 percent of their fall 1957 enrollment (public, 97.8; private, 93.0).

investment is 16.0 percent of building investment. This figure is exceeded at universities (17.0 percent), independent technological schools (21.5 percent), and other independent professional schools (also 21.5 percent). The lowest percentage (12.5) is for teachers colleges. Regionally 2/, all percentages for the combined types of institutions exceed that for the United States except in the North Central (13.6). For universities also, the only regional percentage less than that for the combined regions is for the North Central (14.0). The percentage for the combined regions for liberal arts colleges (14.7) is exceeded only in the West (16.6), and the lowest percent (12.0) is for the Northeast region. The overall percentage for teachers colleges (12.5) is exceeded only in the South (13.2), with the lowest (11.8) being in the Northeast. The South has the largest percentage for independent technological schools, 28.3; the Northeast the smallest, 12.5. Regionally, percentages are most uniform for other independent professional schools, ranging from 20.1 percent in the Northeast to 22.4 in the West. The percentage for the combined regions for junior colleges (15.4) is exceeded in the Northeast and the West, with the low of 12.5 being in the North Central.

The percent that equipment expenditure is of building investment for certain types of private colleges and universities is presented graphically in figure 2 by period of initial occupancy. The curves present a similar picture to that which has been discussed for public institutions--a trend towards

2/ Regional groupings in the tables of this report are: Northeast--Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; North Central--Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South--Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and District of Columbia; and West--Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

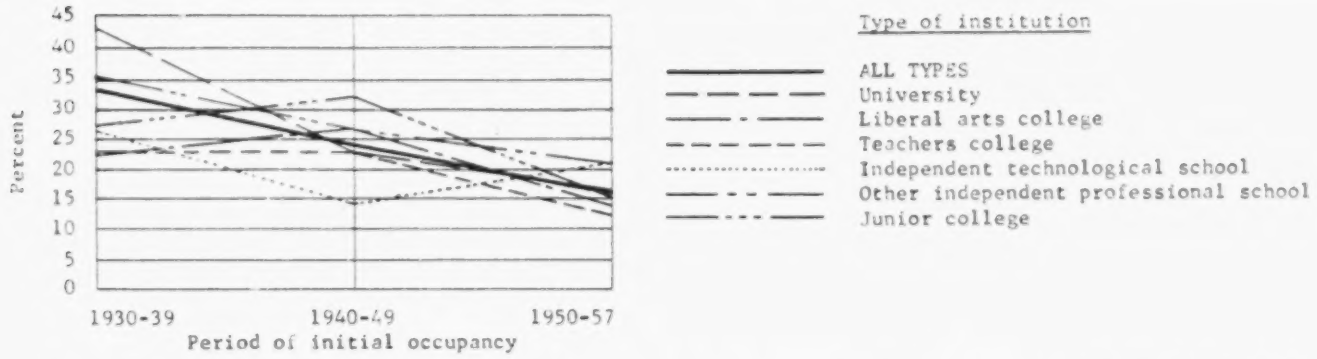

Figure 1.--Ratio of equipment investment to building investment at PUBLIC colleges for selected periods by type of institution: United States

Table 1.--Ratio of investment 1/ in equipment to that in buildings occupied initially during 1950-57 at PUBLIC colleges and universities, by region and type of institution: United States 2/

(Dollars are in thousands. Each "percent" represents the equipment investment divided by the building investment.)

Region	Type of investment	All types	University	Liberal arts college	Teachers college	Independent technological school	Other independent professional school	Junior college
United States	Building	$1,099,350	$475,277	$176,563	$229,341	$28,942	$81,631	$107,596
	Equipment	175,852	80,881	26,012	28,648	6,250	17,526	16,535
	Percent	16.0	17.0	14.7	12.5	21.5	21.5	15.4
Northeast	Building	$ 157,684	$ 72,758	$ 9,224	$ 42,634	$ 400	$25,044	$ 7,624
	Equipment	25,554	13,041	1,107	5,049	50	5,027	1,280
	Percent	16.2	17.9	12.0	11.8	12.5	20.1	16.8
North Central	Building	$ 275,695	$123,685	$ 21,939	$ 96,679	$ 6,987	$ 7,957	$ 8,448
	Equipment	37,598	17,261	4,119	11,879	1,527	1,754	1,058
	Percent	13.6	14.0	12.9	12.3	21.9	22.0	12.5
South	Building	$ 418,107	$192,339	$ 84,536	$ 66,308	$ 8,533	$40,215	$ 26,176
	Equipment	71,075	34,946	12,327	8,748	2,414	8,862	3,778
	Percent	17.0	18.2	14.6	13.2	28.3	22.0	14.4
West	Building	$ $247,864	$ 86,495	$ 50,864	$ 23,720	$13,022	$ 8,415	$ 65,348
	Equipment	41,625	15,633	8,459	2,972	2,259	1,883	10,419
	Percent	16.8	18.1	16.6	12.5	17.3	22.4	15.9

1/ As reported December 31, 1957.
2/ Includes matched figures only; that is, an investment figure for a building was used only when the figure for its equipment was also reported, and vice versa.

smaller percents, narrower span in their range, and convergence.

Data for higher education institutions under private control are reported in table 2, again for the 1950-57 period only. In the United States, for the combined types of institutions, it is noted that equipment investment is 13.3 percent of building capital outlay, 2.7 percent less than for public institutions. This figure is exceeded at universities (14.0 percent), teachers colleges (17.0 percent), independent technological schools (18.7 percent), and other independent professional schools (17.1 percent). The lowest percent (11.3) is for theological and religious schools. On a regional basis, the percentage for the combined types of institutions is exceeded only by those of the North Central and West. This regional relationship is the same for universities, with the North Central and West having the highest percentages and the Northeast the lowest. The percentage for the combined regions for liberal arts colleges (12.3) is exceeded in the South (12.7) and West (15.0). The overall percentage for teachers colleges (17.0) is exceeded in both the Northeast (26.9) and the North Central (17.8). The extremes in percents are found in those for teachers colleges--a high of 26.9 for the Northeast, and a low of 4.6 for the South. The percentage for the combined regions for independent technological schools (18.7) is exceeded only by that for the South (22.5). The 11.3 percent for theological and religious schools for the combined regions is less than those for the Northeast (19.2) and the South (12.0). The percentage for the combined regions for other independent professional schools (17.1) is exceeded by that of every region except the Northeast (12.5). For junior colleges, the percentage for the combined regions (11.9) is exceeded by those for the South (13.0) and the West (18.6).

Figure 3 shows graphically the percentage that equipment investment is of building cap-

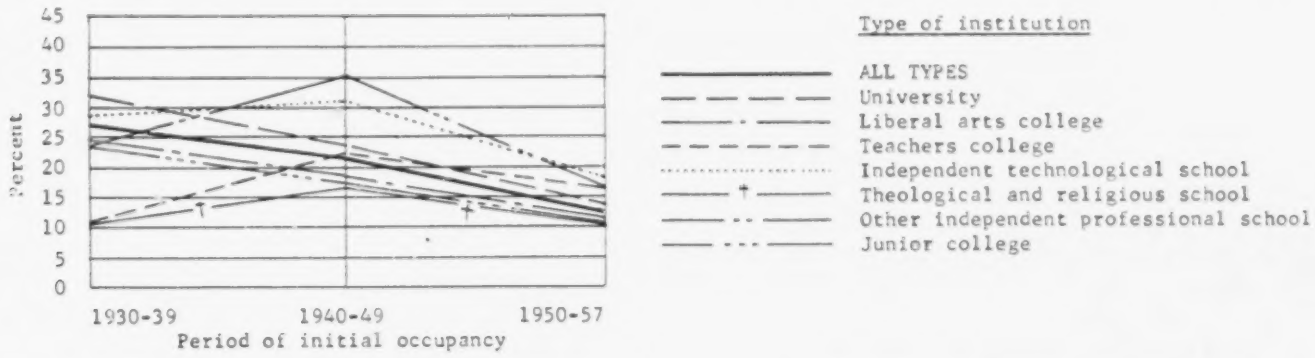

Figure 2.--Ratio of equipment investment to building investment at PRIVATE colleges for selected periods by type of institution: United States

Table 2.--Ratio of investment 1/ in equipment to that in buildings occupied initially during 1950-57 at PRIVATE colleges and universities, by region and type of institution: United States 2/

(Dollars are in thousands. Each "percent" represents the equipment investment divided by the building investment.)

Region	Region and type of investment	All types	University	Liberal arts college	Teachers college	Independent technological school	Theological and religious school	Other independent professional school	Junior college
United States	Building	$759,003	$235,882	$410,604	$3,655	$35,560	$16,983	$22,211	$33,559
	Equipment	100,703	32,956	50,396	623	6,651	1,927	3,798	4,005
	Percent	13.3	14.0	12.3	17.0	18.7	11.3	17.1	11.9
Northeast	Building	$303,425	$107,949	$150,291	$1,139	$19,003	$ 1,462	$13,133	$10,448
	Equipment	38,008	13,397	17,861	306	3,467	281	1,647	1,049
	Percent	12.5	12.4	11.9	26.9	18.2	19.2	12.5	10.0
North Central	Building	$188,524	$ 40,764	$115,149	$1,209	$12,424	$ 5,534	$ 4,701	$ 8,737
	Equipment	25,506	7,293	13,126	215	2,253	488	1,163	967
	Percent	13.5	17.9	11.4	17.8	18.1	8.8	24.7	11.1
South	Building	$201,794	$ 74,163	$103,726	$ 505	$ 4,133	$ 6,344	$ 639	$12,284
	Equipment	26,657	10,003	13,189	23	931	763	147	1,601
	Percent	13.2	13.5	12.7	4.6	22.5	12.0	23.0	13.0
West	Building	$ 65,260	$ 13,006	$ 41,438	$ 802	$ ---	$ 3,643	$ 3,738	$ 2,090
	Equipment	10,532	2,253	6,220	79	---	395	841	388
	Percent	16.1	17.4	15.0	9.9	---	10.8	22.5	18.6

1/ As reported December 31, 1957.
2/ Includes matched figures only; that is, an investment figure for a building was used only when the figure for its equipment was also reported, and vice versa.

ital outlay at public institutions by facilities category and period of initial occupancy. The trend towards reduced percents and convergence mentioned earlier is again observed.

Table 3 presents data for public higher education institutions for the 1950-57 period only. The 16.0 percent that equipment investment is of building investment in the United States (as reported earlier in table 1) is exceeded by the corresponding percents for all categories except residential, which has the lowest percentage, 8.5. By facilities category, the highest percentage is for general (25.3), followed by research (20.7), instructional (18.2), and auxiliary (17.6). Regionally, all percentages for the combined categories exceed that for the United States except in the North Central. For the instructional facilities category, the North Central retains the position of lowest percent (15.9) and the combined regions percent is exceeded only by the Northeast (20.3) and the West (19.1). The percentage for the combined regions for research (20.7) is exceeded only in the North Central region (26.2), and the lowest percentage (17.7) is for the West. The overall percentage for general facilities (25.3) is exceeded by both the South (31.9) and the West (26.3), while the Northeast has the smallest percentage (12.6). The percentage of the combined regions for auxiliary facilities (17.6) is exceeded in all regions except the Northeast (12.2), with the greatest percent being found in the South (19.9). The regional average for residential (8.5) is exceeded only in the South (9.6), with the West having the lowest percentage (6.9).

For private colleges and universities, the

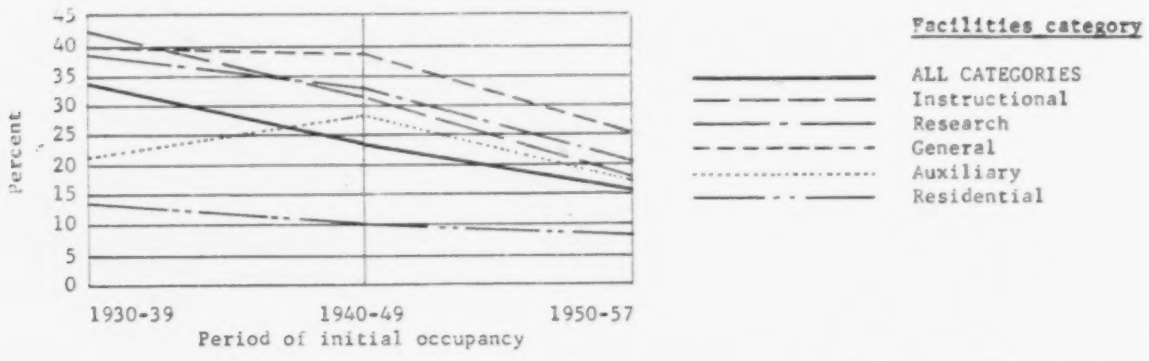

Figure 3.--Ratio of equipment investment to building investment at PUBLIC colleges for selected periods by facilities category: United States

Table 3.--Ratio of investment 1/ in equipment to that in buildings occupied initially during 1950-57 at PUBLIC colleges and universities, by region and facilities category: United States 2/

(Dollars are in thousands. Each "percent" represents the equipment investment divided by the building investment.)

Region and type of investment		All categories	Instructional	Research	General	Auxiliary	Residential
United States	Building	$1,009,350	$525,134	$122,180	$53,881	$80,107	$318,048
	Equipment	175,852	95,659	25,292	13,652	14,133	27,116
	Percent	16.0	18.2	20.7	25.3	17.6	8.5
Northeast	Building	$ 157,684	$ 73,055	$ 26,254	$ 6,230	$16,611	$ 35,534
	Equipment	25,554	14,831	4,965	785	2,023	2,950
	Percent	16.2	20.3	18.9	12.6	12.2	8.3
North Central	Building	$ 275,695	$107,711	$ 19,063	$11,981	$16,918	$120,022
	Equipment	37,598	17,109	4,988	2,298	3,220	9,983
	Percent	13.6	15.9	26.2	19.2	19.0	8.3
South	Building	$ 418,107	$197,990	$ 61,044	$21,145	$27,549	$110,379
	Equipment	71,075	35,738	12,533	6,748	5,480	10,576
	Percent	17.0	18.1	20.5	31.9	19.9	9.6
West	Building	$ 247,864	$146,378	$ 15,819	$14,525	$19,029	$ 52,113
	Equipment	41,625	27,981	2,806	3,821	3,410	3,607
	Percent	16.8	19.1	17.7	26.3	17.9	6.9

1/ As reported December 31, 1957.
2/ Includes matched figures only; that is, an investment figure for a building was used only when the figure for its equipment was also reported, and vice versa.

percent that equipment expenditures is of building investment by facilities category is presented graphically in figure 4 by period of initial occupancy. The trend towards smaller percents and convergence continues here, but the span in ranges for the final period is much less than was found for public institutions.

Data by facilities category for higher education institutions under private control are presented in table 4 for the 1950-57 period only. The percent that equipment investment is of building capital outlay in the United States, 13.3 (as reported previously in table 2), is exceeded by the corresponding percent for each category except residential, which is 8.7. On a regional basis, the percentage for the combined categories is exceeded only by the North Central (13.5) and West (16.1). This relationship by region applies to instructional facilities also, with the West having the largest percentage (23.9) and the Northeast the smallest (13.9). The percentage for the combined regions for research facilities (18.1) is exceeded by the North Central (24.2) and the South (23.4), and the lowest percentage, 15.8, is for the West. The South (20.3) and West (19.9) both exceed the regional average for general facilities (16.0). The lowest percentage is for the Northeast (12.7). For the combined regions, auxiliary facilities equipment investment is 15.7 percent of the capital expenditure for the buildings, being exceeded in the North Central (18.7 percent) and West (21.9 percent). Residential facilities equipment has a higher percentage in the Northeast (8.8) and West (9.6) than for the four combined regions (8.7). The lowest percent (8.2) is found in the South.

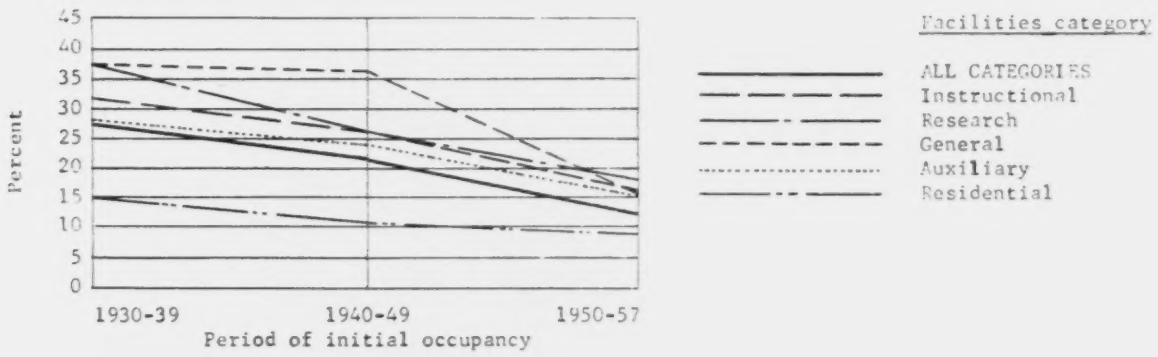

Figure 4.--Ratio of equipment investment to building investment at PRIVATE colleges for selected periods by facilities category: United States

Table 4.--Ratio of investment 1/ in equipment to that in buildings occupied initially during 1950-57 at PRIVATE colleges and universities, by region and facilities category: United States 2/

(Dollars are in thousands. Each "percent" represents the equipment investment divided by the building investment.)

Region and type of investment		All categories	Instructional	Research	General	Auxiliary	Residential
United States	Building	$759,003	$293,492	$$72,974	$36,245	$43,256	$313,036
	Equipment	100,703	47,780	13,237	5,791	6,793	27,102
	Percent	13.3	16.3	18.1	16.0	15.7	8.7
Northeast	Building	$303,425	$108,104	$58,835	$14,777	$13,852	$107,857
	Equipment	38,008	14,008	10,072	1,872	1,584	9,472
	Percent	12.5	13.9	17.1	12.7	11.4	8.8
North Central	Building	$188,524	$ 78,000	$ 2,633	$ 5,323	$13,001	$ 89,567
	Equipment	25,506	14,116	636	657	2,429	7,668
	Percent	13.5	18.1	24.2	12.3	18.7	8.6
South	Building	$201,794	$ 83,261	$ 9,354	$13,890	$12,766	$ 82,523
	Equipment	26,657	12,880	2,189	2,813	1,983	6,792
	Percent	13.2	15.5	23.4	20.3	15.5	8.2
West	Building	$ 65,260	$ 24,127	$ 2,152	$ 2,255	$ 3,637	$ 33,089
	Equipment	10,532	5,776	340	449	797	3,170
	Percent	16.1	23.9	15.8	19.9	21.9	9.6

1/ As reported December 31, 1957.
2/ Includes matched figures only; that is, an investment figure for a building was used only when the figure for its equipment was also reported, and vice versa.

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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

November 1963 OE-51004-18

NEW CONSTRUCTION AND REHABILITATION ON COLLEGE CAMPUSES, 1961-62

by W. Robert Bokelman, Chief, Business Administration Section
and
Leslie F. Robbins, Specialist for Business Administration

Reported expenditures for new construction and rehabilitation projects completed by colleges and universities in 1961-62 amounted to $895 million, exceeding the amount reported for any previous year (new construction, $834 million; and rehabilitation, $61 million). Publicly controlled institutions spent $493 million, and privately controlled institutions, $402 million.

Information on 1961-62 construction and rehabilitation was obtained by this office at the same time data were gathered on 1962-63 salaries and basic student charges. The responding institutions represented 90 percent of the enrollment of public institutions and 87 percent of the enrollment of private institutions. The total number of responding institutions was 1,643; the number reporting projects completed was 720; and the number of completed projects was 1,694.

Public institutions completed 837 projects, and private institutions, 857 projects (49.4 and 50.6 percent, respectively, of the total number of projects); however, of the total expenditures for these projects, 55 percent were made by public institutions and 45 percent by private institutions.

New construction and rehabilitation accounted for 93 percent and 7 percent, respectively, of total expenditures. In number of projects, the division was 71 percent for new construction and 29 percent for rehabilitation.

Data derived from studies of opening fall enrollment in 1961 and 1962 indicate that the year's increase in full-time enrollment which these facilities were completed in time to accommodate was 239,402 (2,682,150 to 2,921,552). If the total expenditures for public and private institutions are expanded to represent 100-percent enrollment, the expenditures would total $1,009,500,000. This amount divided by the number of additional full-time students would result in an average expenditure per additional full-time student of $4,217.

Comparisons with Other Years

Total expenditures for construction and rehabilitation in 1961-62 were larger than expenditures for the preceding year by 10 percent and larger than those for the highest earlier year (1959-60) by 8 percent. The private institutions increased their capital expenditures over the preceding year by a larger percentage than did the public institutions: 22 percent and 2 percent, respectively; in number of projects, the increase by private institutions over the previous year was 25 percent. Total expenditures for rehabilitation were 15 percent higher than for the preceding year.

The average cost per project (including rehabilitation) was $528,000, which was less than the average for the preceding year, $583,000, due probably to the proportionately larger number of

both new construction and rehabilitation projects reported by the private institutions in 1961-62. On the average, private institutions are smaller in enrollment than public institutions and so tend to build smaller buildings. For new construction projects only, the average cost was $689,000, and for rehabilitation projects only, the average cost was $126,000.

Functional Types

Among the five functional groups of facilities, the instructional group as a whole took a larger share (43 percent) of the total expenditures than any other group. The residential group was in second place with 32 percent. The other groups, in order, were auxiliary (other than residential), 9 percent, and general and research, 8 percent each. Both public and private institutions ranked instructional facilities first and residential second, but there were slight variations in their rankings of the other three groups. Private institutions reported a slightly smaller emphasis on instructional and research facilities and a reciprocally larger emphasis on residential, other auxiliary, and general facilities. Table A shows the distribution of projects and expenditures by functional group of facilities. Table 1 shows number and cost of projects by primary function.

Regional Variations

Regionally, the distribution of expenditures for new construction and rehabilitation in 1961-62 followed roughly the distribution of enrollment (opening fall) as shown in table B.

Table A.--Percentage distribution of new construction and rehabilitation projects completed by higher education institutions, and their cost, by control and functional group of facilities: Aggregate United States, 1961-62

Functional group	Total				Public				Private			
	No.	Percent	Amount (000)	Percent	No.	Percent	Amount (000)	Percent	No.	Percent	Amount (000)	Percent
Total	1,694	100.0	$894,741	100.0	837	100.0	$493,187	100.0	857	100.0	$401,554	100.0
Instructional	598	35.3	381,076	42.6	355	42.4	231,239	46.9	243	28.4	149,837	37.3
Research	138	8.1	74,016	8.3	90	10.7	42,498	8.6	48	5.6	31,518	7.8
General	221	13.1	74,519	8.3	112	13.4	36,497	7.4	109	12.7	38,022	9.5
Residential	561	33.1	283,993	31.7	204	24.4	148,903	30.2	357	41.6	135,090	33.7
Other auxiliary	176	10.4	81,137	9.1	76	9.1	34,050	6.9	100	11.7	47,087	11.7

Table B.--Distribution of 1961-62 expenditures and of 1961 opening fall enrollment: Aggregate United States

Region	Opening fall enrollment 1961		Expenditures (000) 1961-62	
	Number	Percent	Amount	Percent
Total	3,891,230	100.0	$894,741	100.0
North Atlantic	1,033,267	26.6	269,517	30.1
Great Lakes and Plains	1,113,653	28.6	256,115	28.6
Southeast	628,296	16.1	146,636	16.4
West and Southwest	1,072,037	27.6	216,558	24.2
U.S. Service Schools	13,390	0.3	5,846	0.7
Outlying parts	30,587	0.8	69	Less than 0.05

State Expenditures

New York was the State with the largest expenditure for new construction and rehabilitation projects completed in 1961-62, $92 million. (See table 2.) California was in second place with $86 million but was first of all States in the number of projects completed, 171. Other States with large expenditures for projects completed in 1961-62 were, in order: Pennsylvania, $58 million; Ohio, $48 million; Illinois, $39 million; Michigan and Massachusetts, $35 million each; Texas, $34 million; North Carolina, $32 million; New Jersey, $31 million; and Indiana, $30 million. The combined total of these 11 States comprised 58 percent of the national total for the year.

Average Cost of New Construction

As was found in earlier studies, the Southeast region had the lowest cost per gross square foot of new construction. (See table 3.) Public institutions, as a whole, continued to show lower square foot costs than did private institutions; however, in two regions (the Southeast and the West and Southwest) this was not true.

A computation of average cost per gross square foot by primary function of facility (table 4) can have value to some institutional planners for rough estimating purposes. Naturally, an average unit cost which is based upon a large number of projects is likely to be more reliable for estimating the cost of a proposed new "average" project of its functional type than would be a unit cost derived from only a few projects.

Sources of Funds [1/]

As was true for other years, in public institutions the principal source of funds for construction of new instructional, research, and general facilities was governmental appropriations. (See table 5.) For residential and other auxiliary types of buildings, revenue bonds provided the major portion.

In private institutions, gifts and grants produced the largest share of funds with which to build new instructional, research, general, and other auxiliary facilities, and revenue bonds provided most of the funds for residential facilities.

Rehabilitation

General averages in the field of rehabilitation have very limited value, since their size and nature are so diverse and miscellaneous. Table 6 is included to illustrate the various distributions--by region, by functional group, and by control. One value of displaying the figures is to remind the reader that not all expenditures in the area of facilities result in increased student capacity.

1/ When construction funds for public and private institutions were considered as a whole, the chief single source of funds for total construction was revenue bonds and the Housing and Home Finance Agency purchased 61 percent of them.

Table 1.--Number and cost of new construction and rehabilitation projects completed by higher education institutions, by control and primary function: Aggregate United States, 1961-62

Primary function	Total		Public		Private	
	No.	Amount (000)	No.	Amount (000)	No.	Amount (000)
Total	1,694	$894,741	837	$493,187	857	$401,554
Total instructional	598	381,076	355	231,239	243	149,837
Demonstration school	13	4,778	9	4,159	4	619
Fieldhouse	12	1,707	10	1,393	2	314
Gymnasium	48	29,648	30	20,620	18	9,028
Home management laboratory	7	1,966	6	366	1	1,600
Instructional classroom	311	197,188	190	124,845	121	72,343
Library	72	58,747	30	24,786	42	33,961
Museum	5	1,347	1	214	4	1,133
Instructional laboratory	94	59,706	59	37,071	35	22,635
Swimming pool	8	1,613	3	437	5	1,176
Teaching hospital	9	18,062	6	14,441	3	3,621
Other instructional	19	6,314	11	2,907	8	3,407
Total research	138	74,016	90	42,498	48	31,518
Agriculture research	27	6,834	26	6,414	1	420
Astronomy research	3	147	1	127	2	20
Biological research	26	15,625	15	9,855	11	5,770
Chemistry research	11	7,338	6	5,930	5	1,408
Mathematical & statistical research	2	543	2	543	---	---
Physics research	15	3,732	11	3,338	4	394
Other physical sciences research	9	2,639	7	2,145	2	494
Social science research	4	584	2	519	2	65
Engineering research	15	13,580	10	3,551	5	10,029
Medical research	26	22,994	10	10,076	16	12,918
Total general	221	74,519	112	36,497	109	38,022
Administration building	49	15,340	17	7,350	32	7,990
Auditorium	7	5,645	2	1,518	5	4,127
Chapel	15	4,903	---	---	15	4,903
Extension & experiment station	10	2,155	9	2,132	1	23
Garage	2	2,106	1	1,553	1	553
Hospital (nonteaching)	5	1,420	3	115	2	1,305
Maintenance shops	17	1,807	12	791	5	1,016
Multipurpose	23	12,659	5	1,087	18	11,572
Education office building	21	5,027	16	3,264	5	1,763
Stadium	11	3,130	10	2,960	1	170
Theater	3	495	1	30	2	465
Power & heating plant	36	16,531	25	14,251	11	2,280
Warehouse	6	907	4	858	2	49
Other general facilities	16	2,394	7	588	9	1,806
Total residential	561	283,993	204	148,903	357	135,090
Faculty apartments	14	7,746	2	1,165	12	6,581
Faculty-staff houses	37	1,261	9	209	28	1,052
Fraternity & sorority houses	25	5,598	14	4,229	11	1,369
Hotel-type accommodations	4	1,182	3	1,139	1	43
Married students apartments	40	29,465	20	19,724	20	9,741
Men's residence halls	195	109,079	77	64,852	118	44,227
Women's residence halls	208	111,496	64	44,730	144	66,766
President's home	21	1,274	4	117	17	1,157
Residence halls with separate units for men & women	9	15,822	7	12,166	2	3,656
Other residential	8	1,070	4	572	4	498
Total other auxiliary	176	81,137	76	34,050	100	47,087
College union	59	39,890	22	16,812	37	23,078
Food facilities	67	26,276	30	12,796	37	13,480
Infirmary	18	9,148	7	1,273	11	7,875
Other auxiliary	32	5,823	17	3,169	15	2,654

Table 2.--Number and cost of new construction and rehabilitation projects completed by higher education institutions, by control, region, and State: Aggregate United States, 1961-62.

State and region	Total		Public		Private	
	No. of projects	Amount (000)	No. of projects	Amount (000)	No. of projects	Amount (000)
Total	1,694	$894,741	837	$493,187	857	$401,554
North Atlantic	444	269,517	110	66,513	334	203,004
Connecticut	31	10,110	---	---	31	10,110
Delaware	10	3,701	10	3,701	---	---
District of Columbia	8	3,903	---	---	8	3,903
Maine	20	5,489	14	4,530	6	959
Maryland	34	13,937	18	8,265	16	5,672
Massachusetts	63	34,573	3	3,512	60	31,061
New Hampshire	13	5,557	3	1,475	10	4,082
New Jersey	28	30,759	10	6,580	18	24,179
New York	107	92,390	17	18,943	90	73,447
Pennsylvania	104	57,830	20	11,424	84	46,406
Rhode Island	13	4,788	8	3,128	5	1,660
Vermont	13	6,480	7	4,955	6	1,525
Great Lakes & Plains	425	256,115	201	149,420	224	106,695
Illinois	56	38,578	19	20,800	37	17,778
Indiana	39	30,496	19	23,447	20	7,049
Iowa	41	18,379	17	8,605	24	9,774
Kansas	25	11,334	11	5,612	14	5,722
Michigan	44	35,197	34	28,276	10	6,921
Minnesota	33	19,284	15	12,312	18	6,972
Missouri	31	16,509	7	3,095	24	13,414
Nebraska	20	9,012	11	5,130	9	3,882
North Dakota	17	7,013	15	6,548	2	465
Ohio	81	48,167	31	19,271	50	28,896
South Dakota	6	2,751	6	2,751	---	---
Wisconsin	32	19,395	16	13,573	16	5,822
Southeast	404	146,636	223	95,864	181	50,772
Alabama	26	11,732	13	9,816	13	1,916
Arkansas	18	7,052	12	5,626	6	1,426
Florida	27	15,196	24	11,833	3	3,363
Georgia	43	9,471	21	6,112	22	3,359
Kentucky	31	17,694	11	12,779	20	4,915
Louisiana	28	12,227	25	10,921	3	1,306
Mississippi	48	7,364	39	6,366	9	998
North Carolina	66	32,121	25	11,714	41	20,407
South Carolina	32	7,140	15	5,093	17	2,047
Tennessee	31	6,375	6	1,853	25	4,522
Virginia	41	10,708	22	5,174	19	5,534
West Virginia	13	9,556	10	8,577	3	979
West & Southwest	412	216,558	294	175,475	118	41,083
Alaska	1	779	1	779	---	---
Arizona	13	8,138	13	8,138	---	---
California	171	86,022	127	74,977	44	11,045
Colorado	30	15,180	15	11,755	15	3,425
Hawaii	4	2,348	---	---	4	2,348
Idaho	6	832	5	387	1	445
Montana	9	7,748	7	6,983	2	765
Nevada	1	620	1	620	---	---
New Mexico	15	1,799	10	1,464	5	335
Oklahoma	17	8,096	14	5,942	3	2,154
Oregon	24	9,669	17	7,188	7	2,481
Texas	76	33,933	47	26,242	29	7,691
Utah	20	16,952	15	9,682	5	7,270
Washington	19	19,890	16	16,766	3	3,124
Wyoming	6	4,552	6	4,552	---	---
U.S. Service Schools	5	5,846	5	5,846	---	---
Outlying parts	4	69	4	69	---	---
Puerto Rico	4	69	4	69	---	---

Table 3.--Gross square foot cost for higher education new construction projects which reported area, by control and region: Aggregate United States, 1961-62

Region	Total				Public				Private			
	No. of projects	Gross sq. ft. (00)	Cost (000)	Cost per sq. ft.	No. of projects	Gross sq. ft. (00)	Cost (000)	Cost per sq. ft.	No. of projects	Gross sq. ft. (00)	Cost (000)	Cost per sq. ft.
All regions	1,171	415,550	$814,638	$19.60	600	241,911	$452,135	$18.70	571	173,639	$362,503	$20.90
North Atlantic	285	108,661	241,995	22.30	83	31,029	62,494	20.10	202	77,632	179,501	23.10
Great Lakes & Plains	284	116,316	227,947	19.60	129	69,791	130,194	18.70	155	46,525	97,753	21.00
Southeast	282	81,430	134,917	16.60	164	53,086	89,347	16.80	118	28,344	45,570	16.10
West & Southwest	317	106,798	204,402	19.10	221	85,660	164,723	19.20	96	21,138	39,679	18.80
U.S. Service Schools	3	2,345	5,377	22.90	3	2,345	5,377	22.90	---	---	---	---

Table 4.--Gross square foot cost for total higher education new construction projects which reported area, by primary function: Aggregate United States, 1961-62

Primary function	No. of projects	Gross sq. ft. (00)	Cost (000)	Cost per sq. ft.
Total	1,171	415,550	$814,638	$19.60
Total instructional	431	179,137	358,403	20.00
Demonstration school	9	2,534	4,119	16.30
Fieldhouse	10	1,054	1,534	14.60
Gymnasium	43	16,707	28,877	17.30
Home management laboratory	5	976	1,924	19.70
Instructional classroom	198	91,331	181,250	19.80
Library	64	30,828	57,107	18.50
Museum	3	527	1,212	23.00
Instructional laboratory	72	24,905	58,677	23.60
Swimming pool	8	945	1,613	17.10
Teaching hospital	4	6,440	15,929	24.70
Other instructional	15	2,890	6,161	21.30
Total research	94	26,300	65,100	24.80
Agricultural research	25	4,548	6,602	14.50
Astronomy research	2	26	137	52.70
Biological research	19	5,707	13,924	24.40
Chemistry research	4	2,306	6,668	28.90
Mathematical & statistical research	2	213	543	25.50
Physics research	9	1,007	3,385	33.60
Other physical sciences research	8	1,601	2,630	16.40
Social science research	1	218	509	23.30
Engineering research	13	5,006	13,377	26.70
Medical research	11	5,668	17,325	30.60
Total general	94	25,461	46,891	18.40
Administration building	19	5,071	12,096	23.90
Auditorium	4	1,706	4,069	23.90
Chapel	11	1,398	4,346	31.10
Extension & experiment station	7	896	1,843	20.60
Garage	2	4,954	2,106	4.30
Hospital (nonteaching)	3	331	1,324	53.80
Maintenance shops	14	1,826	1,763	9.70
Multipurpose	9	4,030	11,749	29.20
Education office building	6	1,639	4,155	25.40
Theater	1	168	275	16.40
Warehouse	6	1,011	907	9.00
Other general facilities	12	2,431	2,258	9.30
Total residential	434	151,861	268,498	17.70
Faculty apartments	10	3,712	7,732	20.80
Faculty-staff houses	28	725	1,158	16.00
Fraternity & sorority houses	20	3,057	5,183	17.00
Hotel-type accommodations	4	473	1,182	25.00
Married students apartments	39	17,635	29,377	16.70
Men's residence halls	155	58,456	102,584	17.30
Women's residence halls	149	58,637	103,297	17.60
President's home	13	592	1,103	18.60
Residence halls with separate units for men & women	9	8,170	15,822	19.40
Other residential	7	404	1,060	26.20
Total other auxiliary	118	32,791	75,746	23.10
College union	43	16,580	39,031	23.50
Food facility	43	8,928	22,726	25.50
Infirmary	12	2,471	8,755	35.40
Other auxiliary	20	4,812	5,234	10.90

Table 5.--Percentage distribution of fund sources for new construction completed by higher education institutions, by functional group and control: Aggregate United States, 1961-62.

/L = Less than 0.05 percent./

Source	All functional groups		Instructional		Research		General		Residential		Other Auxiliary	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total appropriations	42.2	3.6	61.2	7.4	63.4	8.2	57.3	2.8	10.5	---	16.8	---
State	36.6	2.4	56.2	5.9	47.5	0.5	52.5	1.2	6.8	---	11.4	---
Local	1.6	L	1.9	---	0.1	L	4.3	---	0.1	---	5.4	---
Federal	4.0	1.2	3.1	1.5	15.8	7.7	0.5	1.6	3.6	---	---	---
Total tax levy	2.2	---	4.0	---	1.7	---	1.7	---	0.1	---	1.1	---
State	1.2	---	2.2	---	1.7	---	1.2	---	---	---	---	---
Local	1.0	---	1.8	---	---	---	0.5	---	0.1	---	1.1	---
Total general obligation bonds	13.9	2.5	20.7	0.9	5.6	0.6	17.3	2.2	5.8	5.6	10.9	---
Local	4.6	---	7.8	---	2.2	---	6.1	---	---	---	5.4	---
State	6.7	0.1	9.2	---	2.7	0.6	9.5	---	4.8	---	0.4	---
State authority	0.8	1.8	0.3	---	0.7	---	1.5	---	0.8	5.3	2.8	---
Institutional	1.8	0.6	3.4	0.9	---	---	0.2	2.2	0.2	0.3	2.3	---
Total revenue bonds	28.6	23.0	5.9	0.5	---	---	5.4	---	68.8	57.7	57.5	13.6
Other than H.H.F.A.	12.2	0.1	5.9	0.2	---	---	5.4	---	25.4	0.1	17.2	---
H.H.F.A.	16.4	22.9	---	0.3	---	---	---	---	43.4	57.6	40.3	13.6
Total other sources	13.1	70.9	8.2	91.2	29.3	91.2	18.3	95.0	14.8	36.7	13.7	86.4
Gifts and grants	3.1	47.3	2.6	66.0	13.5	72.8	7.0	63.6	0.5	18.4	2.1	34.0
Current funds	1.6	5.0	0.8	4.2	2.2	8.9	0.1	12.0	2.4	3.6	3.2	27.1
Endowment funds	0.5	3.8	0.5	1.8	2.0	8.6	---	---	0.3	3.6	---	10.4
Borrowed from other college funds	2.1	3.4	0.8	3.9	9.3	---	4.8	0.1	1.6	2.4	2.0	2.2
Borrowed from commercial sources	4.6	9.2	3.1	12.8	---	---	6.3	12.9	8.5	7.3	1.2	10.1
Other	1.2	2.2	0.4	2.5	2.3	0.9	0.1	6.4	1.5	1.4	5.2	2.6

Table 6.--Cost of rehabilitation projects, by number, control, region, and functional group: Aggregate United States, 1961-62.

Region	Total		Public		Private	
	No.	Amount (000)	No.	Amount (000)	No.	Amount (000)
All regions	484	$60,901	208	$24,791	276	$36,110
North Atlantic	153	23,645	23	2,172	130	21,473
Great Lakes & Plains	126	19,091	62	10,839	64	8,252
Southeast	114	10,130	54	5,149	60	4,981
West & Southwest	85	7,497	63	6,093	22	1,404
U.S. Service Schools	6	538	6	538	---	---
Functional group						
All groups	484	60,901	208	24,791	276	36,110
Instructional	167	22,673	90	14,178	77	8,495
Research	44	8,916	18	2,130	26	6,786
General	88	8,426	41	4,359	47	4,067
Residential	127	15,495	40	2,624	87	12,871
Other auxiliary	58	5,391	19	1,500	39	3,891

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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CLASSROOM FACILITIES PLANNING AIDS

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Publicly controlled higher education buildings of the United States housed a total of 34,673 general or academic classrooms as of December 31, 1957; the classrooms contained 25,016,000 square feet of assignable area and encompassed 1,460,096 student stations (table 1). Privately controlled higher education buildings housed a total of 30,685 general or academic classrooms; the classrooms contained 20,713,900 square feet of assignable area and encompassed 1,211,717 student stations (table 3). These data were reported for the "Inventory of College and University Physical Facilities, December 31, 1957"[1/] by 85.0 percent of the higher education institutions of the United States, which represented 95.7 percent of the fall 1957 enrollment in higher education.

Tables 1 and 3 (for public and private institutions, respectively) show State and regional distribution of classroom data by: (1) number of classrooms, (2) total assignable area, (3) classroom size, (4) number of student stations, (5) average classroom capacity, and (6) student station size. The assignable area of a classroom includes any auxiliary area devoted exclusively to the functions of the classroom. Assignable area is measured from the inside walls at floor level. A student station is considered to be a place at which a student may be located--for example, a lecture-room seat. The area of a classroom student station is therefore the assignable area required to provide all accommodations necessary for one student.

Tables 2 and 4 (for public and private institutions, respectively) report, by region, normative data for the classrooms, including means, medians, and interquartile ranges. Comparison of these tables reveals that public institutions tend to have larger classrooms than private ones. For all public institutions the mean classroom size was 721 square feet, varying from a mean of 670 square feet in the South to 761 square feet in the North Central region; for all private institutions the mean classroom size was 675 square feet, with essentially no difference in the North Central and West, and a 2 percent deviation above the national mean in the Northeast and 3 percent below in the South. Concomitantly, the mean number of student stations in classrooms of public institutions exceeded the mean number of student stations in classrooms of private institutions, 42 to 40. Interestingly, however, the mean student station size was the same for total public institutions as for total private institutions, 17.1 square feet.

List A presents, by State, the names and locations of buildings having at least 10 general or academic classrooms reported to have been occupied for the first time during the years 1953-57, the last 5 years of the period covered by this survey.

List B is a bibliography on classroom facilities planning.

1/ Part 3 of a 5-part study by the Office of Education, College and University Facilities Survey.

Table 1.--Number, assignable area, and student station size of general or academic classrooms at public higher education institutions participating in the College and University Facilities Survey, Part 3, as of December 31, 1957, by region and State

Region and State	CLASSROOMS			STUDENT STATIONS		
	Number	Assignable area		Total	Mean number per classroom	Mean assignable area per student station (sq. ft.)
		Total (in hundreds of sq. ft.)	Mean per classroom (sq. ft.)			
AGGREGATE UNITED STATES....	35,108	253,450	721	1,477,487	42	17.2
CONTIGUOUS STATES[1/].....	34,673	250,160	721	1,460,096	42	17.1
NORTHEAST.....	3,992	30,347	760	164,109	41	18.5
Connecticut.....	71	566	797	2,755	39	20.5
Maine.....	180	1,352	751	7,131	40	19.0
Massachusetts.....	394	3,277	831	12,932	33	25.3
New Hampshire.....	135	980	725	7,869	58	12.5
New Jersey.....	523	4,157	794	18,079	35	23.0
New York.....	1,770	12,378	699	76,876	43	16.1
Pennsylvania.....	733	6,445	879	30,969	42	20.8
Rhode Island.....	68	424	623	2,834	42	15.0
Vermont.....	118	768	650	4,664	40	16.5
NORTH CENTRAL.....	9,668	73,619	761	462,674	47	15.9
Illinois.....	1,310	10,274	784	55,868	43	18.4
Indiana.....	683	4,994	731	35,890	53	13.9
Iowa.....	733	5,540	755	39,041	53	14.2
Kansas.....	858	6,172	719	36,050	42	17.1
Michigan.....	1,809	13,651	754	84,471	47	16.2
Minnesota.....	556	5,055	909	35,607	64	14.2
Missouri.....	649	4,829	744	30,508	47	15.8
Nebraska.....	476	3,411	716	21,284	45	16.0
North Dakota.....	342	2,468	721	13,954	41	17.7
Ohio.....	1,259	9,601	762	66,870	53	14.4
South Dakota.....	304	2,185	718	11,475	38	19.0
Wisconsin.....	689	5,439	789	31,656	45	17.2
SOUTH.....	13,707	91,880	670	506,637	37	18.1
Alabama.....	765	5,488	717	24,870	33	22.1
Arkansas.....	541	3,580	661	19,653	36	18.2
Delaware.....	91	568	624	3,697	41	15.4
Florida.....	597	4,003	670	23,310	39	17.2
Georgia.....	1,163	6,546	562	32,040	28	20.4
Kentucky.....	586	4,425	755	25,368	43	17.4
Louisiana.....	830	5,897	710	37,563	45	15.7
Maryland.....	434	3,025	697	20,265	47	14.9
Mississippi.....	1,094	6,168	563	28,686	26	21.5
North Carolina.....	1,055	6,969	660	38,947	37	17.9
Oklahoma.....	998	7,557	757	43,328	43	17.4
South Carolina.....	555	5,251	946	21,167	38	24.8
Tennessee.....	715	5,138	718	29,075	41	17.7
Texas.....	2,791	16,513	591	95,104	34	17.4
Virginia.....	810	5,856	722	33,185	41	17.6
West Virginia.....	528	3,719	704	23,562	45	15.8
District of Columbia.....	154	1,177	764	6,817	44	17.3
WEST.....	7,306	54,314	743	326,676	45	16.6
Arizona.....	333	2,596	779	17,562	53	14.8
California.....	3,226	25,189	780	149,207	46	16.9
Colorado.....	615	4,363	709	28,301	46	15.4
Idaho.....	294	1,906	648	12,383	42	15.4
Montana.....	282	2,073	735	12,163	43	17.0
Nevada.....	92	703	764	4,087	44	17.2
New Mexico.....	369	2,571	696	13,472	37	19.1
Oregon.....	495	3,655	738	26,232	53	13.9
Utah.....	449	3,085	687	18,738	42	16.5
Washington.....	952	6,984	733	37,884	40	18.4
Wyoming.....	199	1,189	597	6,647	33	17.9
U. S. SERVICE SCHOOLS...	116	729	628	2,217	19	32.9
OUTLYING PARTS.....	319	2,561	802	15,174	48	16.9
Alaska.....	33	276	836	905	27	30.5
Canal Zone.....	(2/)	(2/)	-	(2/)	-	-
Guam.....	(2/)	(2/)	-	(2/)	-	-
Hawaii.....	98	847	864	6,585	67	12.9
Puerto Rico.....	188	1,438	764	7,684	41	18.7

1/ Excludes U. S. Service Schools.

2/ Not reported.

Table 2.--Number, assignable area, and student station size of general or academic classrooms at public higher education institutions participating in the College and University Facilities Survey, Part 3, as of December 31, 1957, based upon State means, by region: Contiguous States

Classrooms	Contiguous States	Region 1/			
		Northeast	North Central	South	West
a. Number of classrooms.....	34,673	3,992	9,668	13,707	7,306
b. Total assignable area (in hundreds of sq.ft.).....	250,160	30,347	73,619	91,880	54,314
c. Number of student stations.....	1,460,096	164,109	462,674	506,637	326,676
CLASSROOM SIZE (sq.ft.)					
d. Mean (line b ÷ line a).....	721	743	761	670	743
e. Median.....	725	720	754	669	751
f. Interquartile range.....	694-763	692-827	735-774	590-719	720-780
CLASSROOM CAPACITY (student stations)					
g. Mean (line c ÷ line a).....	42	41	47	37	45
h. Median.....	43	42	47	37	46
i. Interquartile range.....	37-46	40-47	44-53	34-42	41-48
STUDENT STATION SIZE (sq.ft.)					
j. Mean (line b ÷ line c).....	17.1	18.5	15.9	18.1	16.6
k. Median.....	17.2	16.6	16.2	17.5	16.8
l. Interquartile range.....	16.1-18.2	15.9-21.8	14.6-17.2	17.4-19.5	16.1-17.0

1/ See table 1 for inclusions.

Table 3.--Number, assignable area, and student station size of general or academic classrooms at private higher education institutions participating in the College and University Facilities Survey, Part 3, as of December 31, 1957, by region and State

Region and State	CLASSROOMS			STUDENT STATIONS		
	Number	Assignable area		Total	Mean number per classroom	Mean assignable area per student station (sq. ft.)
		Total (in hundreds of sq. ft.)	Mean per classroom (sq. ft.)			
AGGREGATE UNITED STATES.....	30,746	207,599	675	1,214,136	40	17.1
CONTIGUOUS STATES.....	30,685	207,139	675	1,211,717	40	17.1
NORTHEAST.....	10,368	71,467	689	438,149	42	16.3
Connecticut.....	278	1,791	644	10,250	37	17.5
Maine.....	168	1,035	616	6,047	36	17.1
Massachusetts.....	1,661	14,286	860	77,569	47	18.4
New Hampshire.....	205	1,280	624	3,314	41	15.4
New Jersey.....	977	4,604	471	33,592	34	13.7
New York.....	3,538	24,687	697	160,779	45	15.4
Pennsylvania.....	3,090	20,714	670	125,536	41	16.5
Rhode Island.....	284	2,060	725	10,625	37	19.4
Vermont.....	167	1,010	604	5,437	33	18.6
NORTH CENTRAL.....	8,547	57,928	677	339,466	40	17.1
Illinois.....	1,817	12,960	713	76,887	42	16.9
Indiana.....	890	5,923	665	35,243	40	16.8
Iowa.....	732	4,717	644	25,937	35	18.2
Kansas.....	420	2,720	647	13,894	33	19.6
Michigan.....	656	4,677	712	26,367	40	17.7
Minnesota.....	478	3,308	692	20,664	43	16.0
Missouri.....	1,211	7,678	634	43,893	36	17.5
Nebraska.....	259	1,883	727	11,106	43	17.0
North Dakota.....	22	122	554	1,022	47	11.9
Ohio.....	1,395	9,409	674	56,853	41	16.5
South Dakota.....	163	879	539	4,968	31	17.7
Wisconsin.....	504	3,652	724	22,632	45	16.1
SOUTH.....	8,901	58,447	656	318,037	36	18.4
Alabama.....	366	2,481	677	16,734	46	14.8
Arkansas.....	256	1,711	668	8,819	34	19.4
Delaware.....	17	163	958	990	58	16.5
Florida.....	474	3,229	681	17,569	37	18.4
Georgia.....	1,021	4,366	427	23,313	23	18.7
Kentucky.....	384	2,873	748	13,902	36	20.7
Louisiana.....	363	2,405	662	15,252	42	15.8
Maryland.....	438	3,172	724	17,936	41	17.7
Mississippi.....	220	1,369	622	7,623	35	18.0
North Carolina.....	895	6,097	681	34,268	38	17.8
Oklahoma.....	339	2,389	704	13,253	39	18.0
South Carolina.....	378	3,445	911	13,964	37	24.7
Tennessee.....	855	5,470	639	31,203	37	17.5
Texas.....	1,680	11,041	657	54,542	33	20.2
Virginia.....	549	3,750	683	19,303	35	19.4
West Virginia.....	135	869	643	4,771	35	18.2
District of Columbia.....	531	3,617	681	24,595	46	14.7
WEST.....	2,869	19,297	672	116,065	41	16.6
Arizona.....	36	183	508	970	27	18.9
California.....	1,494	10,030	671	64,440	43	15.6
Colorado.....	282	2,366	839	9,841	35	24.0
Idaho.....	51	293	574	1,609	36	18.2
Montana.....	53	343	647	1,857	35	18.5
Nevada.....	-	-	-	-	-	-
New Mexico.....	12	97	803	540	45	18.0
Oregon.....	335	2,208	659	11,541	35	19.1
Utah.....	203	1,240	610	9,126	45	13.6
Washington.....	403	2,537	629	16,141	40	15.7
Wyoming.....	-	-	-	-	-	-
OUTLYING PARTS.....	61	460	754	2,419	40	19.0
Alaska.....	-	-	-	-	-	-
Canal Zone.....	-	-	-	-	-	-
Guam.....	-	-	-	-	-	-
Hawaii.....	24	207	862	850	35	24.4
Puerto Rico.....	37	253	683	1,569	42	16.1

Table 4.--Number, assignable area, and student station size of general or academic classrooms at private higher education institutions participating in the College and University Facilities Survey, Part 3, as of December 31, 1957, based upon State means, by region: Contiguous States

Classrooms	Contiguous States	Region 1/			
		Northeast	North Central	South	West
a. Number of classrooms.....	30,685	10,368	8,547	8,901	2,869
b. Total assignable area (in hundreds of sq.ft.).....	207,139	71,467	57,928	58,447	19,297
c. Number of student stations.....	1,211,717	438,149	339,466	318,037	116,065
CLASSROOM SIZE (sq.ft.)					
d. Mean (line b ÷ line a).....	675	689	677	656	672
e. Median.....	672	686	676	670	656
f. Interquartile range.....	653-699	664-706	648-714	647-682	645-717
CLASSROOM CAPACITY (student stations)					
g. Mean (line c ÷ line a).....	40	42	40	36	41
h. Median.....	41	43	41	37	40
i. Interquartile range.....	36-43	40-45	37-47	32-38	36-43
STUDENT STATION SIZE (sq.ft.)					
j. Mean (line b ÷ line c).....	17.1	16.3	17.1	18.4	16.6
k. Median.....	16.9	16.1	17.4	18.5	15.5
l. Interquartile range.....	15.7-18.3	15.2-16.8	16.6-17.5	17.7-19.9	15.0-18.3

1/ See table 3 for inclusions.

List A.--College and University Buildings Containing at Least 10 General or Academic Classrooms and Reported To Have Been Occupied for the First Time During the 1953-1957 Calendar Pentad: Aggregate United States

State and institution	Name of building	Year
Alabama		
Alabama State College	Councill Hall	1956
Howard College	Frank Park Samford Hall	1955
Miles College	Alabama Hall	1957
University of Alabama, Birmingham	Birmingham Center Building	1954
University of Alabama, Montgomery	Montgomery Center Building	1956
University of Alabama, University	Music and Speech Building	1955
Arkansas		
Harding College	American Studies Building	1953
California		
American River Junior College	Name not reported	1955
Bakersfield College	Business Building	1955
	Humanities Building	1955
California State Polytechnic College	Science and Classroom Building	1955
City College of San Francisco	Cloud Hall	1955
College of the Holy Names	Classroom Building	1957
Compton District Junior College	Instructional (Academic) Buildings (C, D-2, E-2, F-2)	1953
Diablo Valley College	Library-Classroom Building	1955
El Camino College	Commerce Building	1953
	New Social Science Classroom Building No. 2	1956
Fresno State College	Education-Psychology Building	1955
Long Beach State College	Classroom Wing No. 1	1954
	Classroom Wing No. 2	1954
	Classroom Wing No. 3	1956
	Language Arts Building	1954
Los Angeles State College of Applied Arts and Sciences	General Classroom Buildings F, J and K	1956
Northrop Institute of Technology	Engineering Building L	1956
Sacramento State College	Business Administration Building	1957
	Douglass Hall	1953
San Diego City College	Administration and Technology Building	1956
San Diego State College	Humanities-Social Sciences Building	1957
San Francisco State College	Business-Social Science Building	1953
	Education Building	1954
	Humanities-Language Arts Building	1957
San Jose City College	Original Portable Buildings	1953
	Vocational Center Building	1953
San Jose State College	Centennial Hall	1957
	Music Building	1953
Santa Monica City College	Science-Commerce Building	1953
United States Naval Postgraduate School	Root Hall No. 235	1954
University of California, Los Angeles	Humanities Building	1956
	Mathematical Sciences Building	1957
University of California, Riverside	Social Sciences-Humanities Building	1953

State and institution	Name of building	Year
California--con.		
University of California, Santa Barbara	Classroom and Office Building	1957
Vallejo Junior College	Administration Building	1954
Ventura College	Classroom Buildings J and K	1956
Contra Costa College	Humanities Building	1956
Colorado		
Colorado School of Mines	Alderson Hall	1953
Colorado State College	Frasier Hall	1954
Colorado State University	Engineering Building	1957
Pueblo Junior College	Administration Building	1956
Western State College of Colorado	Kelley Hall	1957
Connecticut		
Central Connecticut State College	Henry Barnard Hall	1953
Fairfield University	Canisius Hall	1957
Rensselaer Polytechnic Institute	Hartford Graduate Division Building	1955
Southern Connecticut State College	Administration-Classroom-Library Building	1953
Florida		
Florida Agricultural and Mechanical University	Jones Hall (Science)	1955
	Perry-Page Hall (Agriculture)	1956
	Tucker Hall	1957
Palm Beach Junior College	Building A	1956
Pensacola Junior College	Administration Building	1957
St. Petersburg Junior College	Class Building	1956
University of Florida	Matherly Hall	1954
	Stadium Building	1955
Georgia		
Atlanta University	Sage Hall	1953
Emory University, Atlanta	Bishops Hall	1957
Fort Valley State College	Hubbard Education Building	1957
Georgia State College of Business Administration	33 Gilmer Street	1955
Mercer University	Humanities Building	1957
Illinois		
Chicago Conservatory College	Creative Arts Center	1957
Illinois State Normal University	Schroeder Hall	1957
Illinois Wesleyan University	Shall Hall	1956
Northern Illinois University	Reavis Hall	1957
Northwestern University	Kresge Centennial Hall	1956
St. Xavier College	Classroom Building No. 2	1956
	Science Building No. 4	1956
Indiana		
Ball State Teachers College	Practical Arts Building	1954
Indiana State College	Education-Social Studies Building	1953
Marian College, Indianapolis	Marian Hall	1954
University of Notre Dame	Nieuwland Science Building	1953
Iowa		
Upper Iowa University	Colgrove-Walker Memorial Building	1956

State and institution	Name of building	Year
Iowa--con.		
Upper Iowa University--con.	College Hall	1957
Kansas		
Dodge City College	College Building	1957
University of Wichita	Engineering Building	1953
Washburn University of Topeka	Morgan Hall	1955
Kentucky		
Bellarmine College	Administration Building	1954
Centre College of Kentucky	The Weisiger Art and Music Building	1956
Louisiana		
Northeast Louisiana State College	Administration Building	1956
Southeastern Louisiana College	Tinsley Hall	1956
Maryland		
Morgan State College	Soldier's Armory	1957
Massachusetts		
Boston College	Campion Hall	1954
Northeastern University	Hayden Hall	1956
State College at Westfield	Administration Building	1956
Stonehill College	Holy Cross Hall	1957
University of Massachusetts	Machmer Hall	1957
Michigan		
Aquinas College	Administration Building	1955
Central Michigan University	Library Building	1954
Eastern Michigan University	Strong Science Building	1957
Flint Junior College	Curtice Building	1955
	Mott Arts and Science Building	1955
Lawrence Institute of Technology	Building A	1955
Michigan College of Mining and Technology	Civil and Geology Building	1957
Michigan State University of Agriculture and Applied Science	Music Building	1955
Siena Heights College	Angelicus Hall	1954
Wayne State University	Community Arts Building	1956
Missouri		
Central Bible Institute	W. I. Evans Hall	1956
Marillac College	Administration Building	1957
University of Kansas City	Grant Hall	1955
Montana		
Carroll College	Science Building	1957
Montana State College	Mathematics-Physics Building	1954
Montana State University	Liberal Arts Building	1954
Northern Montana College	Cowan Hall	1953
Nebraska		
College of Saint Mary	Administration Building	1955
University of Nebraska	Nebraska Psychiatric Institute	1953
Nevada		
University of Nevada	Ross Hall	1957

State and institution	Name of building	Year
New Jersey		
Fairleigh Dickinson University, Rutherford	East Rutherford Building	1957
Fairleigh Dickinson University, Teaneck	Williams Hall	1954
St. Peter's College	Dinneen Hall	1957
Seton Hall University, Paterson	Paterson School Building	1956
New York		
Agricultural and Technical Institute at Alfred	Industrial Laboratory Building	1955
Brooklyn College	Walt Whitman Hall	1954
College of Education at Fredonia	Administration-Classroom-Library Building	1953
College of Education at Potsdam	Administration-Classroom Building	1954
Hofstra College	Phillips Hall	1953
	Roosevelt Hall	1957
Manhattan College	Hayden Science Hall	1953
Mohawk Valley Technical Institute	New Hartford Building	1955
New School for Social Research	76 West 12th Street Building	1956
Orange County Community College	Hudson Hall	1955
Polytechnic Institute of Brooklyn	Rogers Hall	1954
Russell Sage College, Albany	Evening Division Building	1953
St. John's University, Long Island Division	Liberal Arts Building	1955
Staten Island Community College	50 Bay Street Building	1956
North Carolina		
Agricultural and Technical College of North Carolina	Cherry Hall	1955
	Hodgin Hall	1955
Atlantic Christian College	Classroom Building	1956
Duke University	Allen Building	1954
Meredith College	Joyner Hall	1956
North Carolina College at Durham	Commerce Building	1956
	Education Building	1955
University of North Carolina at Chapel Hill	Gardner Building	1953
	Hanes Hall	1953
Wake Forest College	Wait Chapel-Wingate Hall	1956
North Dakota		
Bismarck Junior College	Name not reported	1955
University of North Dakota	Education Building	1954
Ohio		
Ashland College	Administration Building	1954
Case Institute of Technology	Electrical Engineering Building	1955
Ohio State University	Law Building	1956
Ohio University	Copeland Hall	1956
The University of Akron	Kolbe Hall	1955
Oklahoma		
Benedictine Heights College	Administration and Classroom Building	1956
Oklahoma City University	Industrial Arts Building	1955
Oregon		
Linfield College	Riley Hall	1956
Multnomah College	Administration Building	1954

State and institution	Name of building	Year
Oregon--con.		
Portland State College	State Hall, N.W. Unit	1956
Willamette University	Auditorium-Fine Arts Building	1955
Pennsylvania		
Allegheny College	Quigley Hall	1953
Chatham College	Coolidge Hall of Humanities	1953
	Falk Hall of Social Studies	1953
	Braun Hall of Administration	1953
Eastern Pilgrim College	Rees Hall	1954
Gannon College	Engineering Building	1954
Holy Family College	College Building	1954
Immaculata College	Good Counsel Hall	1955
Indiana State College	Leonard Hall	1953
Lafayette College	Olin Hall of Science	1956
The Pennsylvania State University	Boucke Building	1956
Susquehanna University	Heilman Hall	1957
Temple University, Philadelphia	Curtis Hall	1955
Villanova University	Commerce and Finance Building	1957
Puerto Rico		
University of Puerto Rico	General Studies Building	1956
South Carolina		
South Carolina State College	Staley Building	1954
	Turner Hall	1956
University of South Carolina	Business Administration Building	1955
	School of Engineering Building	1955
Tennessee		
Christian Brothers College	Ave Maria Hall	1954
Fisk University	Park-Johnson Hall	1954
Memphis State University	Administration Building Annex	1953
University of Tennessee, Knoxville	Claxton Education Building	1956
Texas		
Abilene Christian College	Bible Building	1955
Amarillo College	Engineering Building	1956
Baylor University	Tidwell Building	1954
Kilgore College	Administration Building	1957
Lamar State College of Technology	Business School Building	1957
McMurray College	Cooke Hall	1957
Odessa College	Main Building	1953
St. Philip's College	Bowden Administration Building	1953
Southern Methodist University	Fincher Building	1954
	Selecman Hall	1953
Southwestern University	Alma Thomas Fine Arts Center and Theater	1956
	Fondren Science Hall	1954
Stephen F. Austin State College	C. W. Birdwell Building	1955
Texarkana College	Classroom Building	1956
Texas Christian University	Dann D. Rogers Hall	1957
	Undergraduate Religion Building	1954
Texas Woman's University	North Wing, Liberal Arts Building	1955
University of Dallas	Science Building	1956
University of Houston	Downtown School Building	1957

State and institution	Name of building	Year
Utah		
Brigham Young University	Family Living Center Building	1957
	McKay Building	1955
University of Utah	Orson Spencer Hall	1956
Utah State University of Agriculture and Applied Science	Edith Bowen Building	1956
Virginia		
Mary Washington College of the University of Virginia	Jessie Ball DuPont Hall	1953
Virginia Polytechnic Institute, Blacksburg	Commerce Hall	1957
	Williams Hall	1953
Washington		
Grays Harbor College	Classroom Building	1957
Olympic College	Science Building	1954
Seattle University	William Pigott Building	1957
University of Puget Sound	Music Building	1953
University of Washington	Communications Building	1955
	Drama-TV Building	1956
Whitworth College	Dixon Hall	1956
West Virginia		
Bluefield State College	Technical Science Building	1954
West Virginia University, Morgantown	Mechanical Hall No. 1	1957
West Virginia Wesleyan College	Lynch-Raine Administration Building	1955
Wisconsin		
Northwestern College	Classroom Building	1956
University of Wisconsin, Madison	Commerce Building	1954
Wisconsin State College, Oshkosh	Dempsey Hall	1956
Wyoming		
Casper Junior College	Main Hall	1955
Northwest Community College	Main Building	1955

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Division of Higher Education

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College and University Physical Facilities Series

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

R-7-8.

January 1964 OE-51004-12A

SPACE UTILIZATION BIBLIOGRAPHY

by E. Eugene Higgins, Specialist for Physical Facilities
and
Linda L. Wright, Research Aide

Earlier releases in this series have reported normative data with regard to science facilities, libraries, general classrooms, married-student apartments, and residence halls for single students, including assignable area and number of student stations or capacity, as appropriate, for higher education buildings reported in a survey. These early releases represented preliminary data from Part 3 of the College and University Facilities Survey, entitled "Inventory of College and University Physical Facilities, December 31, 1957."[1/]

In the first of this series (OE-51004-1, page 2, item 5) it was pointed out that one of the specific (and very important) values to an institution of its inventory is that it provides a basis for a space utilization study. Desiring to encourage such studies, the Office of Education has compiled a space utilization bibliography from which individual colleges or higher education groups can work in either self-surveys or multi-college studies. Further, it is hoped that copies of such utilization studies will be made available to the Office of Education, thereby providing comparative information for which frequent inquiry is made.

It is recognized today that all institutions are concerned with the problem of providing for larger and larger student enrollments and that optimum use of existing facilities is the first step toward solution of the problem. Ideally such a step should precede planning for expansion of facilities.

1/ Now in process.

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OE-51004-4: Student Accommodations in Instructional Facilities, 1960-61 and Planned for 1965-66. July 1962.

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OE-51004-6: Expenditures Planned for Higher Education Facilities, 1961-65. July 1962.

OE-51004-7: Classroom Facilities Planning Aids. June 1962.

OE-51004-8: Married-Student Apartment Planning Aids. July 1962.

OE-51004-9: Residence Hall Planning Aids. July 1962.

OE-51004-10: Campus Parking Bibliography. August 1962.

OE-51004-11: Student Infirmary Planning Aids. August 1962.

OE-51004-13: College Union Planning Aids. August 1962.

OE-51004-14: Gross Area of Non-Residential Buildings, by Facilities Category. September 1962.

OE-51004-15: New Construction and Rehabilitation on College Campuses, 1959-60. August 1962.

OE-51004-16: Assignable Area of College and University Buildings, by Facilities Category, Function, and Type of Institution. April 1963.

OE-51004-17: Ratio of Equipment Investment to Building Investment. June 1963.

OE-51004-18: New Construction and Rehabilitation on College Campuses, 1961-62. November 1963.

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